

WHAT IS CLAIMED IS

1. A speech synthesizing method comprising:

the division step of acquiring partial speech segments by dividing a speech segment in a

5 predetermined unit with a phoneme boundary;

the estimation step of estimating a power value of each partial speech segment obtained in the division step on the basis of a target power value;

10 the changing step of changing the power value of each of the partial speech segments on the basis of the power value estimated in the estimation step; and

the generating step of generating synthesized speech by using the partial speech segments changed in the changing step.

15 2. The method according to claim 1, wherein

in the changing step, for each of the partial speech segments,

20 a corresponding reference power value is acquired, an amplitude change magnification is calculated on the basis of the power value estimated in the estimation step and the acquired reference power value, and

25 a change to the estimated power value is made by changing an amplitude of the partial speech segment in accordance with the calculated amplitude change magnification.

3. The method according to claim 2, wherein in the

changing step, an amplitude value of the partial speech segment is changed by using, as an amplitude change magnification, s being obtained by

$$s = (p/q)^{1/2}$$

5 where p is the power value estimated in the estimation step, and q is the acquired reference power value.

4. The method according to claim 1, wherein
the estimation step further comprises the
determination step of determining whether each of the
10 partial speech segments is a voiced or unvoiced sound,
and

if it is determined that the partial speech
segment is a voiced sound, a power value is estimated
by using a parameter value for a voiced speech segment,
15 and if it is determined that the speech segment is an
unvoiced sound, a power value is estimated by using a
parameter value of an unvoiced speech segment.

5. The method according to claim 4, wherein
the estimation step further comprises the
20 acquisition step of acquiring a power estimation factor
for each of the partial speech segments, and

a parameter value corresponding to the acquired
power estimation factor is acquired in accordance with
a determination result obtained in the determination
25 step.

6. The method according to claim 5, wherein the
power estimation factor includes one of a phoneme type

of the partial speech segment, a mora position of a synthesis target word of the partial speech segment, a mora count of the synthesis target word, and an accent type.

5 7. The method according to claim 5, wherein in the acquisition step, a power estimation factor for a voiced sound is acquired if it is determined in the determination step that the partial speech segment is a voiced sound, and a power estimation factor for an
10 unvoiced sound is acquired if it is determined that the partial speech segment is an unvoiced sound.

8. The method according to claim 4, wherein
in the change step, a reference power value of the partial speech segment is acquired, and an
15 amplitude of the partial speech segment is changed on the basis of the power value estimated in the estimation step and the acquired reference power value, and

the reference power value corresponding to a
20 partial speech segment of an unvoiced sound is set to relatively large.

9. The method according to claim 1, wherein the speech synthesis unit is CV/VC.

10. The method according to claim 1, wherein the
25 speech synthesis unit is VCV.

11. A speech synthesizing apparatus comprising:
division means for acquiring partial speech

segments by dividing a speech segment in a
predetermined unit with a phoneme boundary;

estimation means for estimating a power value of
each partial speech segment obtained by said division
5 means on the basis of a target power value;

changing means for changing the power value of
each of the partial speech segments on the basis of the
power value estimated by said estimation means; and

the generating means for generating synthesized
10 speech by using the partial speech segments changed by
said changing means.

12. The apparatus according to claim 11, wherein
said changing means, for each of the partial
speech segments,

15 acquires a corresponding reference power value,
calculates an amplitude change magnification on
the basis of the power value estimated by said
estimation means and the acquire reference power value,
and

20 makes a change to the estimated power value by
changing an amplitude of the partial speech segment in
accordance with the calculated amplitude change
magnification.

13. The apparatus according to claim 12, wherein said
25 changing means changes an amplitude value of the
partial speech segment by using, as an amplitude change
magnification, s being obtained by

$$s = (p/q)^{1/2}$$

where p is the power value estimated by said estimation means, and q is the acquired reference power value.

14. The apparatus according to claim 11, wherein

5 said estimation means further comprises
determination means for determining whether each of the
partial speech segments is a voiced or unvoiced sound,
and

10 if it is determined that the partial speech
segment is a voiced sound, a power value is estimated
by using a parameter value for a voiced speech segment,
and if it is determined that the speech segment is an
unvoiced sound, a power value is estimated by using a
parameter value of an unvoiced speech segment.

15 15. The apparatus according to claim 14, wherein

 said estimation means further comprises
acquisition means for acquiring a power estimation
factor for each of the partial speech segments, and

20 a parameter value corresponding to the acquired
power estimation factor is acquired in accordance with
a determination result obtained by said determination
means.

16. The apparatus according to claim 15, wherein the
power estimation factor includes one of a phoneme type
25 of the partial speech segment, a mora position of a
synthesis target word of the partial speech segment, a
mora count of the synthesis target word, and an accent

type.

17. The apparatus according to claim 15, wherein said acquisition means acquires a power estimation factor for a voiced sound if it is determined by said

5 determination means that the partial speech segment is a voiced sound, and acquires a power estimation factor for an unvoiced sound if it is determined that the partial speech segment is an unvoiced sound.

18. The apparatus according to claim 14, wherein

10 said change means acquires a reference power value of the partial speech segment, and changes an amplitude of the partial speech segment on the basis of the power value estimated by said estimation means and the acquired reference power value, and

15 the reference power value corresponding to a partial speech segment of an unvoiced sound is set to relatively large.

19. The apparatus according to claim 11, wherein the speech synthesis unit is CV/VC.

20 20. The apparatus according to claim 11, wherein the speech synthesis unit is VCV.

21. A storage medium storing a control program for making a computer implement the method defined in claim 1.